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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/071,439      | 02/08/2002  | Mark R. Hueschen     | 10004217-1          | 2895             |

7590 10/06/2004  
AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
P.O. Box 7599  
Loveland, CO 80537-0599

| EXAMINER |
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BAUMEISTER, BRADLEY W

| ART UNIT | PAPER NUMBER |
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2815

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                   |                                   |  |
|------------------------------|-----------------------------------|-----------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/071,439     | Applicant(s)<br>HUESCHEN, MARK R. |  |
|                              | Examiner<br>B. William Baumeister | Art Unit<br>2815                  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-21 is/are pending in the application.  
     4a) Of the above claim(s) 16-18 and 20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3, 5-15 and 21 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claim 1 is generic and allowable. Accordingly, the restriction requirement as to the encompassed species IA-IC is hereby withdrawn and claims 13 and 14, directed to the species of IA and IC are no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim.

2. Non-elected invention II is related to elected invention I as combination/subcombination. Claim I is generic to/links claim 19 of nonelected invention II. As such, claim 19 is also rejoined. However, claims 16-18 and 20, directed to the non-elected combination of Invention II remain withdrawn from consideration since these claims do not depend upon or otherwise include all the limitations of an allowed generic claim as required by 37 CFR 1.141.

3. In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

*Allowable Subject Matter*

4. Claims 1-3, 5-15 and 21 are allowed.
5. Claim 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. Claims 16-18 and 20 would be subject to rejoinder and would be allowable upon the incorporation of claim 19 into claim 16.
7. The following is a statement of reasons for the indication of allowable subject matter:
  - a. GaN-based tunnel diodes were generally known. It was also known that the piezoelectric properties of the III-N materials could be utilized to enhance the tunneling in such diodes (see e.g., Kneissl and Corzine). It was also known to include a heterojunction layer within the diode to increase tunneling (see e.g., Corzine, FIG 3, layer 181). However, in Corzine the strained InGaN layer is interposed outside of the depletion region instead of at the heterojunction interface as presently claimed.
  - b. Also, while a GaN-based pin LED may be biased sufficiently to tunnel (e.g., Takayama), the Fermi levels of the respective heterointerfaces' conduction and valence bands are not "aligned" in such a conventional emitter.

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***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Kneissl et al. '013.
- b. Furuyama '911
- c. Kub '451

9. This application is in condition for allowance except for the following formal matters:

- a. rejoined claim 19 needs to be re-written into independent form or otherwise properly amended.
- b. Withdrawn claims 16-18 and 20 must either be amended to include all of the limitations of claim 19 in order to also be rejoined and allowed, or otherwise be canceled.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.


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***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. William Baumeister whose telephone number is (571) 272-1722. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BRADLEY BAUMEISTER  
PRIMARY EXAMINER

B. William Baumeister  
Primary Examiner  
Art Unit 2815

October 2, 2004